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UNITED STATES PATENT APPLICATION FOR GRANT OF LETTERS PATENT

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Foldable Bench

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FOLDABLE BENCH

RELATED APPLICATIONS

This application claims priority under 35 U.S.C. § 119(e) from the following U.S. provisional application: Application Serial No. 60/409,538 filed on September 9, 2002. That application is incorporated in its entirety by reference herein.

BACKGROUND OF THE INVENTION

Athletic benches are widely used in a variety of sports ranging from football to soccer. Usually, athletic benches, or benches occupied by players during the course of an athletic contest, come in different sizes and designs. Many such benches are made of wood or metal. However, most athletic or player benches share one common characteristic. They are usually large and far from portable. Such conventional player benches are generally functional. But their size and weight restrict their use to essentially one location.

Certain athletic fields such as soccer fields or baseball fields typically used by children or young adults are not provided with player benches. Thus, those players not actually participating usually stand or kneel on the sidelines. This is not an ideal situation, especially for players taking a break from the athletic action.

Therefore, there has been and continues to be a need for a foldable bench that can be folded and carried from one location to another.

SUMMARY OF THE INVENTION

The present invention entails a foldable bench having at least two seat sections and an underlying support structure. The underlying support structure includes at least two leg

assemblies that are foldable from a folded or retracted position to an extended position. In the extended position the leg assemblies are interconnected by a pair of connectors. Further, the leg assemblies are interconnected by a cable or other interconnecting member.

In one preferred embodiment, when the foldable bench assumes an erect and unfolded position, the connectors extending between the bench and the leg assemblies are maintained in compression while the cable or interconnecting member extended between the leg assemblies is maintained in tension.

Other objects and advantages of the present invention will become apparent and obvious from a study of the following description and the accompanying drawings which are merely illustrative of such invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side elevational view of the foldable bench shown in a folded position.

Figure 2 is a side elevational view of the foldable bench shown in an unfolded and erect position.

Figure 3A is an end elevational view of the bench.

Figure 3B is a sectional view of the lines 3B-3B of Figure 2.

Figure 4A is a fragmentary perspective view showing the underside of a portion of a foldable bench in an erect posture.

Figure 4B is a fragmentary perspective view of a portion of the foldable bench shown in a folded position.

Figure 5 is a perspective view of an underside portion of the foldable bench illustrating the hinge structure interconnecting two seat sections.

DESCRIPTION OF THE INVENTION

With further reference to the drawings, the foldable bench of the present invention is shown therein and indicated generally by the numeral 10. As will be appreciated from subsequent portions of this disclosure, the foldable bench 10 is adapted to assume a folded position, as shown in figure 1, or an unfolded or erect position as shown in figure 2.

Viewing the foldable bench 10 in more detail, the same includes a pair of seat sections, each seat section being indicated generally by the numeral 12. It should be appreciated that the foldable bench 10 could include any number of seat sections 12 but in the case of the embodiment illustrated herein, the foldable bench includes two seat sections. Each seat section includes a top 12A and a bottom 12B. Seat sections 12, and other portions of the foldable bench 10, can be constructed of various materials such as plastic, wood, metal, fiberglass, etc.

To support the foldable bench 10 when the same assumes the unfolded or erect position shown in figure 2, there is provided an underlying support structure. This underlying support structure includes a pair of leg assemblies of 20, each leg assembly being foldable and mounted to the underside 12B about the outboard portion of each seat section 12. Connected between the inboard portions of the seat sections 12 is a hinge assembly 22. As will be appreciated from subsequent portions of the disclosure, the hinge assembly 22 permits the seat sections to be folded back-to-back as shown in figure 1 or to be extended to where the seat sections lie end-to-end and generally within the same plane. A strut or first connector indicated generally by the numeral 24 is connected between each leg assembly 20 and the hinge assembly 22. As will be appreciated subsequent herein, when the foldable bench 10 is unfolded and assumes the erect position of figure 2, the individual connectors 24 are in compression when a load is applied to the erected bench 10. In addition, a cable or interconnecting member 26 is connected between

the leg assemblies **20**. In a preferred embodiment, the interconnecting member assumes the form of a flexible cable **26**. However, it is appreciated that the interconnecting member **26** could simply be a rigid rod, shaft or even a telescoping member.

With reference to figures 3A – 4B, the leg assembly **20** is shown in more detail therein. Each leg assembly mounted to the outboard end of a seat section **12** includes a bracket or mounting plate **30** that is secured to the underside of a respective seat section by bolts, screws or other suitable means. Formed on each side of the bracket is pair of spaced apart gussets **32**. A leg **34** is pivotally mounted between each pair of gussets **32** by a pivot pin **36**. In the case of the present embodiment, pivot pin **36** assumes the form of a bolt and nut assembly. Extending across and between the legs **34** is a cross member **38**. Secured or formed on the inside of the cross member **34** is a stub sleeve **40** that as will be understood later, functions to connect to one end of the connectors **24**. Extending from the central portion of the cross member **38** is a tab **42** that is adapted to connect to one end of the cable **26**.

As seen in figures 4A and 4B, the entire leg assembly **20** can be pivoted via the pivot pins **36** from an extended position (figure 4A) and a retracted or folded position (figure 4B).

With specific reference to figures 2 and 5, the hinge **22** for connecting the seat sections **12** is shown. Hinge **22** includes a pair of brackets **50** and **52**, each bracket being secured to the underside **12B** of a respective seat section about an inboard end. One of the brackets, in this case, bracket **50** includes two sets of hinge fingers, with each hinge finger being referred to by the numeral **56**. On the other bracket **52**, there is provided a pair of spaced apart hinge fingers **58**. As seen in figure 5, the single hinge fingers **58** project into and between a pair of the hinge fingers **56** formed on the opposite bracket **50**. All of the hinge fingers **56** and **58** includes

openings for receiving a pivot pin 60. In this case, each pivot pin 60 includes a bolt and nut assembly.

Therefore, it is seen that the seat sections 12 can be pivoted about the axis of the two pivot pins 60. In one configuration, the foldable bench assumes a folded position (figure 1), and in another configuration the bench sections 12 assume an extended position and wherein, as viewed in figure 2, the hinge assembly 22 also is extended.

Finally, each of the brackets 50 and 52 of the hinge assembly include a pair of connector gussets 62. As seen in figure 5, each pair or set of connector gussets 62 is generally centrally located with each gusset including an opening formed in the outer terminal end.

Pivotaly connected to the connector gussets 66 is the connector 24. A pivot pin 70 in the form of a bolt and nut assembly is extended through the openings within the terminal ends of the gussets 62 and through an opening in one end portion of the connector 24. The other end of the connector 24 is adapted to be inserted into the stub sleeve 40 of one of the leg assemblies 20. This is particularly illustrated in figure 4A. When the foldable bench 10 assumes the unfolded or erect position, it is desirable to lock or secure each connector 24 to a respective leg assembly 20. Therefore, there is provided a locking pin or screw 72 that is adapted to be secured to both the outer end of each connector 24 and a respective stub sleeve 40. The locking pins or screws 72 can be easily and quickly attached and detached to facilitate the folding of the bench 10.

Further, the leg assemblies 20, in an erect position, are interconnected by a cable 26. It is noted that the cable 26 is secured to the leg 20 by connecting to the tabs 42 extending from the cross member 38. Cable 26 can be connected to the tabs in various ways. For example, the opposed terminal ends of the cable 26 can be secured to a bolt assembly which is in turn connected to an opening formed in the tab 42.

In the folded position, as seen in figures 1 and 4B, the leg assemblies 20 are rotated to where the legs 34 point towards the hinge assembly 22. The underside of each seat section 12 includes a recess or cavity 12C that receives a portion of the leg assembly 24. In the case of the embodiment illustrated herein, the recess or cut-out 12C is particularly adapted to receive at least a portion of the cross member 38 and the stub sleeve 40 and tab 42 that are associated with the cross member 38. This tends to make the bench 10 more compact when the same assumes the folded position.

When the bench 10 is extended to its erect position shown in figure 2, it is appreciated that the length of the connectors 24 and the cable 26 is calculated so as to result in the legs of the leg assemblies being directed inwardly at an angle. That is, in the preferred embodiment, the leg assemblies 20 and particularly the legs 34 thereof are not disposed perpendicular to the seat sections 12 but are disposed at an angle as illustrated in figure 2. While this angle may vary, in one exemplary configuration, the legs 34 form an angle of approximately 20 degrees with respect to a reference line that extends through the pivot pins 36 and normal to the seat sections 12. It is contemplated that the angle of the legs 34 with respect to the reference line could vary from 10 to 20 degrees. Further, each strut or connector 24 would preferably extend generally normal to the attached leg assembly 20. That is, each strut or connector 24 would form a generally right angle with respect to the leg assembly 20.

Further, when the foldable bench 10 is disposed in the erect position shown in figure 2, and a load is placed on the bench 10, the connectors 24 are generally held in compression. Cable 26, on the other hand, is maintained in tension and thus prevents the legs from rotating outwardly in response to a load being placed on the bench.

Finally, the foldable bench **10** may assume various configurations and designs. In one particular embodiment, the interconnecting member **26**, as discussed above, could be in the form of a cable and the cable could be utilized as a carrying strap for the entire bench **10** when the same assumes the folded configuration. Additionally, in the embodiments illustrated herein, the bench is shown as including two seat sections **12**. However, it will be appreciated that the foldable bench **10** could include more than two foldable sections.

The present invention may, of course, be carried out in other specific ways than those herein set forth without departing from the scope and the essential characteristics of the invention. The present embodiments are therefore to be construed in all aspects as illustrative and not restrictive and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.